

REMARKS

This Amendment responds to the Office Action dated December 16, 2004 in which the Examiner rejected claim 1 under 35 U.S.C. §102(b) and rejected claims 1-3 under 35 U.S.C. §103.

Applicants respectfully point out to the Examiner that no Notice of References Cited was provided with the Office Action. In particular, U.S. Patent No. 4,433,510 and Japanese Reference JP 11-77521 have not been cited on PTO 892. Applicants respectfully request the Examiner provide a Notice of References Cited.

Attached to this Amendment is a copy of the Information Disclosure Statement filed April 14, 2004. Applicants respectfully traverse the Examiner's statement that the Information Disclosure Statement fails to comply with 37 C.F.R. § 1.98(a)(1). Also attached to this Amendment is a copy of 37 C.F.R. § 1.98. As noted in the patent rules, the references were properly submitted. The statement of relevance is stated on page 1 the first paragraph which states that the information was cited during the prosecution of the parent application. A copy of a translation is not required under the rules and can be provided if it is within the possession, custody or control of or is readily available. Since a translation was not readily available, it has not been provided. Applicants also respectfully point out to the Examiner that the Japanese reference was cited in the rejection of claim 3 of the present application. Therefore, even though a translation was not provided, obviously it has been considered by the Examiner. Therefore, Applicants can think of no reason why the Information Disclosure Statement has not been initialed and returned. Therefore, Applicants respectfully request the Examiner initial and return the PTO 1449 as filed on April 14, 2004.

As indicated above, claim 1 has been amended to make explicit what is implicit in the claim. The amendment is unrelated to a statutory requirement for patentability.

Claim 1 claims a polishing apparatus comprising an upper wheel, a lower wheel, a displacement-detection means and a reference table. The upper wheel is for pressing at least one workpiece to be polished. The lower wheel is for supporting the at least one workpiece. The displacement-detection means, joined to the upper wheel to move together therewith, is for detecting relative displacement between the upper wheel and the lower wheel. The reference table is arranged at a position opposing the displacement-detection means and is integrally fixed to the lower wheel. The reference table provides a displacement-detection reference position. The at least one workpiece is polished by a relative difference in speeds between the at least one workpiece and at least one of the lower wheel and the upper wheel.

Through the structure of the claimed invention having a) a displacement-detection means joined to a center of an upper wheel and b) a reference table arranged at a position opposing the displacement-detection means and integrally fixed to the lower wheel, as claimed in claim 1, the claimed invention provides a polishing apparatus which can accurately detect the relative displacement between the upper and lower wheels so that the workpieces are reliably polished to a desired thickness. The prior art does not show, teach or suggest the invention as claimed in claim 1.

Claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by *Katagiri et al.* (U.S. Patent No. 4,433,510).

Katagiri et al. appears to disclose a lapping machine provided with such an improved means for in-machine controlling of the thickness of the wafer-like work pieces under lapping therein. (col. 1, lines 9-12) The positioning means of the machine illustrated in FIG. 1 is composed of a set of a transmitter 13 fixedly mounted on the lower surface plate 2 at the periphery thereof and a receiver 14 fixedly mounted on the upper surface plate 1 at the periphery thereof for receiving the signal emitted from the transmitter 13. Needless to say, the intensity of the signal received in the receiver 14 is the strongest at the moment when the receiver 14 is just above the transmitter 13 so that the maxima in the continuum of the signal received in the receiver 14 can be used as the positioning signal of the upper surface plate 1 relative to the lower surface plate 2. On the other hand, a sensor 15 is fixedly mounted on the upper surface plate 1 for detecting the width of the gap between the surface plates 1 and 2 and generating a signal corresponding to the thus detected width of the gap which is, in the first approximation, equal to the thickness of the work pieces 3 under lapping. The principle of the sensor 15 for the detection of the gap width is not limitative and various methods are known in the art. For example, the sensor 15 may be an eddy current detector of the electromagnetic coupling of the upper and lower surface plates, usually, made of cast-iron to generate an output signal corresponding to the gap width. Alternatively, the sensor 15 may be a combination of an ultrasonic emitter and a receiver for the echo of the ultrasonic waves reflected at the surface of the lower surface plate 2 to give the delay time of the echo corresponding to the gap width. At any rate, the sensor 15 is fixed on the upper surface plate 1 in the opening 16 provided in the upper surface plate 1 to directly face the lower surface plate 2. The principle of the positioning means is also not

limitative. For example, the transmitter 13 may be a permanent magnet coupled with a Hall element 14 to detect the magnetic flux around the permanent magnet 13.

Alternatively, the transmitter 13 may be an ultrasonic emitter coupled with an ultrasonic receiver 14. At any rate, the transmitter 13 and receiver 14 are mounted on the respective surface plates 2 or 1 in such a manner that the latter passes just above the former as the surface plates are rotated relative to each other. (col. 4, line 31 through col. 5, line 4)

Thus, *Katagiri et al.* merely discloses a transmitter 13 mounted on a periphery of a lower surface plate 2 and a receiver 14 mounted on a periphery of an upper surface plate 1. Nothing in *Katagiri et al.* shows, teaches or suggests a displacement-detection means joined to a center of an upper wheel as claimed in claim 1. Rather, *Katagiri et al.* teaches away from the claimed invention and merely discloses a transmitter 14 mounted on an edge of a lower surface plate 2 and a receiver 14 mounted on an edge of an upper surface plate 1.

Additionally, *Katagiri et al.* merely discloses that the transmitter 13 transmits a signal to receiver 14 and the intensity of the signal varies based upon where the transmitter 13 is relative to the rotation of receiver 14. Thus nothing in *Katagiri et al.* shows, teaches or suggests a) a reference table providing a displacement-detection reference position and b) the reference table is integrally fixed to a lower wheel as claimed in claim 1. Rather, *Katagiri et al.* merely discloses a transmitter 13 which transmits a constant signal to receiver 14, the intensity of which will vary based upon displacement of the transmitter relative to the receiver.

Since nothing in *Katagiri et al.* shows, teaches or suggests a) a displacement-detection means joined to a center of an upper wheel and b) a reference table

integrally fixed to the lower wheel and providing a displacement-detection reference position as claimed in claim 1, Applicants respectfully request the Examiner withdraws the rejection to claim 1 under 35 U.S.C. §102(b).

Claims 1-3 were rejected under 35 U.S.C. §103 as being unpatentable over Applicants' admitted prior art Figure 6 in view of *Katagiri et al.*.

Prior Art Fig. 6 appears to disclose [0002] a known polishing apparatus for polishing a metal, a ceramic, and a semiconductor material as shown in Fig. 6. [003] The polishing apparatus is for polishing the upper and lower surfaces of workpieces W at the same time, and comprises an upper wheel 1 for pressing the workpieces W and a lower wheel 2 for supporting the workpieces W. The upper wheel 1 and the lower wheel 2 are coaxially arranged with each other. A plurality of carries 3, which performs a sun-and-planet rotation while holding the workpieces W, is arranged along the circumferential direction of the upper wheel 1 and the lower wheel 2 and between these two wheels. [0004] The upper wheel 1 is vertically moved by an air cylinder 7 attached to a stationary support member 6. The upper wheel 1 has a substantially spherical holder 1a, formed in the upper middle thereof, for holding a spherical pressure head 8 which is disposed at the bottom of the air cylinder 7. [0005] The pressure head 8 has an electrical micrometer 10 attached thereto as a displacement-detection means for detecting the relative displacement between the upper wheel 1 and the lower wheel 2. The electrical micrometer 10 has a main unit 10a which is fixed to the pressure head 8 and a probe 10b which serves as a displacement-detection rod and which is expandable with respect to the main unit 10a. [006] The lower wheel 2 has a short cylindrical shape and has a substantially cylindrical wheel drive shaft 12 coaxially fixed thereto. In addition, the lower wheel 2

is rotatably supported by a bearing 13 and has gear teeth 12a which are formed around the outer periphery of the bottom portion of the lower wheel 2. The gear teeth 12a engage with a gear 14 which is directly connected to a wheel drive motor 15.

[0007] The wheel drive shaft 12 has a carrier drive shaft 18, coaxially arranged therein and supported by a bearing 19, for rotating and revolving the carriers 3. The carrier drive shaft 18 has gear teeth 18a which are formed around the outer rim periphery of the bottom thereof and which engage with a gear 20 directly connected to a first carrier drive motor 21. The upper part of the carrier drive shaft 18 is enlarged in diameter to form a diameter-enlarged portion 18b. The diameter-enlarged portion 18b has a reference table 22. The reference table 22 is formed at the center of the upper surface of the diameter enlarged portion 18b in a projecting manner so as to be integral therewith, and against which the probe 10b of the electrical micrometer 10 abuts. [0013] Polishing the upper and lower surfaces of each of the workpieces W leads to displacement of the upper wheel 1, resulting in a gradual reduction in the distance between the upper wheel 1 and the lower wheel 2. Thus, when the amount of expansion and contraction of the probe 10b abutting against the reference table 22 changes, the main unit 10a of the electrical micrometer 10 outputs detection signals in accordance with the change in expansion and contraction. Then, a controller (not shown) determines whether or not the thickness of the workpieces W agrees with a predetermined target value on the basis of the detection output from the electrical micrometer 10. When the thickness of the workpieces W reaches the target value, the motors 15, 21, and 28 are stopped thus completing the polishing of the workpieces W. [0014] In the known polishing apparatus, the reference table 22 is fixed at the top of the carrier drive shaft 18, and

the carrier drive shaft 18 is configured separately from the lower wheel 2 by the bearing 19. With this arrangement, a shaky motion of the bearing 19 or the carrier drive shaft 18 in the axial direction thereof prevents a change in expansion and contraction of the probe 10b from accurately following the relative displacement between the upper wheel 1 and the lower wheel 2, thereby causing a detection error of the amount of polishing of the workpieces W. [0015] That is to say, detection of the relative displacement between the lower surface of the upper wheel 1 and the upper surface of the lower wheel 2 is required in order to measure an accurate amount of polishing of the workpieces W. Since the carrier drive shaft 18, to which the lower wheel 2 is fixed, is configured separately from the lower wheel 2, a slight shift of the carrier drive shaft 18 along the axial direction thereof caused by, e.g., a shaky motion of the bearing 19 and the like leads, to a change in expansion and contraction of the probe 10b. As a result, the change in expansion and contraction of the probe 10b does not accurately follow the relative displacement between the upper wheel 1 and the lower wheel 2, thereby giving rise to an error in detecting the relative displacement.

Thus, *Katagiri et al.* merely discloses a carrier drive shaft 18 is configured separately from the lower wheel 2 such that a slight shift of the carrier drive shaft 18 along the axial direction caused by a shaky motion of the bearing leads to a change in expansion and contraction of a probe 10b. Thus, nothing in Applicants' admitted prior art shows, teaches or suggests a reference table integrally fixed to a lower wheel as claimed in claim 1. Rather, prior art Figure 6 teaches away from the claimed invention since the carrier driveshaft 18 is configured separately from the lower wheel (paragraph 0015).

As discussed above, *Katagiri et al.* merely discloses transmitter 13 and receiver 14 provided at the periphery of an upper surface plate 1 and at the periphery of a lower surface plate 2. Nothing in *Katagiri et al.* shows, teaches or suggests a reference table integrally fixed to a lower wheel and providing a displacement-detection reference position as claimed in claim 1.

A combination of Applicants' admitted prior art and *Katagiri et al.* would merely suggest to place transmitter 13 and receiver 14 of *Katagiri et al.* on the wheels of prior art Fig. 6 in order to detect position in addition to the probe 10 of Figure 6. Thus nothing in the combination of the Applicants' admitted prior art and *Katagiri et al.* show, teach or suggest a reference table integrally fixed to a lower wheel as claimed in claim 1. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claim 1 under 35 U.S.C. §103.

Claims 2-3 depend from claim 1 and recite additional features. Applicants respectfully submit that claim 2-3 would not have been obvious within the meaning of 35 U.S.C. §103 over Figure 6 and *Katagiri et al.* at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 2-3 under 35 U.S.C. §103.

Claim 3 was rejected under 35 U.S.C. §103 as being unpatentable over prior art as applied to claim 1 and further in view of JP 11-77521.

Applicants respectfully traverse the Examiner's rejection of the claim under 35 U.S.C. §103. The claim has been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claim to issue.

As discussed above, since nothing in the combination of prior art Figure 6, and/or *Katagiri et al.* show, teach or suggest the primary features as claimed in claim 1, Applicants respectfully submit that the combination of the primary references with the second reference to JP 11-77521 will not overcome the deficiencies of the primary reference. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claim 3 under 35 U.S.C. §103.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge
our Deposit Account No. 02-4800.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: February 7, 2005

By:



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New Patent Application Postcard

Inventor: Toru Nishikawa et al.

Docket No.: 018976-224

Title: Polishing Apparatus

Working Atty.: EME/kdd

Appln. No.: Unassigned

Date: April 14, 2004

Clk. Clerk Initials



The following was/were received in the U.S. Patent and Trademark Office on the date stamped hereon:

- ☐ Utility Patent Application Transmittal
- ☐ Design Patent Application Transmittal
- ☐ Continuing Prosecution Application Request
- ☒ Continuing/Divisional Application (Rule 1.53(b)) with copy of application
- ☐ Provisional Application Cover Sheet
- ☐ Provisional Application Transmittal
- ☐ Request for Continued Examination

INCLUDING:

- ☒ Specification (pages 1 - 17)
- ☒ Claims (claims(s) 1 - 3 , 1 pgs.)
- ☒ Drawings (Fig(s). 1 - 6 , 5 pgs.)
- ☒ Abstract of the Disclosure

- ☐ Executed Declaration/Power of Attorney
- ☐ Unexecuted Declaration/Power of Attorney
- ☐ Assignment/Assignment Recordation Form Cover Sheet (PTO-1595)
- ☐ Submission of Certified Copy of Priority Document w/ certified copy(ies)
- ☐ Preliminary Amendment
- ☐ Information Disclosure Statement Transmittal
- ☒ Information Disclosure Citation (PTO-1449)
- ☒ Information Disclosure Statement w/ 1 document(s)
- ☐ Petition for Month Extension of Time
- ☐ Gen. Authorization for Petition for Ext. of Time and Pymt. of Fees
- ☐ Patent Application Data Sheet

- ☒ Check for \$ 770.00 is enclosed
- ☐ Check for \$ is enclosed
- ☐ Charge \$ to Deposit Account
- ☐ Charge \$ to credit card. Form PTO-2038 is attached.
- ☒ copy of executed Declaration/Power of Attorney
- ☒ copy of Assignment

17302 U.S. PTO
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If submitting documents via Express Mail, provide the Express Mailing Label No. below.

Express Mail Mailing Label No.

The documents are being submitted within three (3) months of the filing or entry of the national stage of this application or before the first Office Action on the merits, whichever is later. Since these documents are being filed within the time period set forth in 37 C.F.R. § 1.97(b), no fee or statement is required.

To assist the Examiner, the document is / documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date April 14, 2004

By: 

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FIRST INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet

1

of

1

C. *delete if Known*

Application Number

Unassigned

Filing Date

April 14, 2004

First Named Inventor

Toru Nishikawa et al.

Examiner Name

Unassigned

Attorney Docket Number

018976-224

U.S. PATENT DOCUMENTS

Examiner Initials	Document Number	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Issue/Publication Date (MM-DD-YYYY)
	4,433,510		Katagiri et al.	02-28-1984
	5,969,521		Kurita et al.	10-19-1999
	5,088,239		Osman	02-18-1992
	4,524,547		Heaston et al.	06-25-1985

FOREIGN PATENT DOCUMENTS

Examiner Initials	Document Number	Kind Code (if known)	Country	Date of Publication (MM-DD-YYYY)	Translation	
					Yes	No
	11-77521		Japan	03-23-1999		X

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.



§ 1.98

CONSOLIDATED PATENT RULES

months prior to the filing of the information disclosure statement.

(f) No extensions of time for filing an information disclosure statement are permitted under § 1.136. If a *bona fide* attempt is made to comply with § 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

(g) An information disclosure statement filed in accordance with section shall not be construed as a representation that a search has been made.

(h) The filing of an information disclosure statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b).

(i) If an information disclosure statement does not comply with either this section or § 1.98, it will be placed in the file but will not be considered by the Office.

[48 FR 2712, Jan. 20, 1983, effective date Feb. 27, 1983; 57 FR 2021, Jan. 17, 1992, effective Mar. 16, 1992; para. (d) revised, 60 FR 20195, Apr. 25, 1995, effective June 8, 1995; paras. (a)-(d) revised, 61 FR 42790, Aug. 19, 1996, effective Sept. 23, 1996; paras. (c)-(e) revised, 62 FR 53131, Oct. 10, 1997, effective Dec. 1, 1997; para. (b) revised, 65 FR 14865, Mar. 20, 2000, effective May 29, 2000 (adopted as final, 65 FR 50092, Aug. 16, 2000); paras. (a) through (e) and (i) revised, 65 FR 54604, Sept. 8, 2000, effective Nov. 7, 2000]

§ 1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under § 1.97 shall include the items listed in paragraphs (a)(1), (a)(2) and (a)(3) of this section.

(1) A list of all patents, publications, applications, or other information submitted for consideration by the Office. U.S. patents and U.S. patent application publications must be listed in a section separately from citations of other documents. Each page of the list must include:

(i) The application number of the application in which the information disclosure statement is being submitted;

(ii) A column that provides a space, next to each document to be considered, for the examiner's initials; and

(iii) A heading that clearly indicates that the list is an information disclosure statement.

(2) A legible copy of:

(i) Each foreign patent;

(ii) Each publication or that portion which caused it to be listed, other than U.S. patents and U.S. patent application publications unless required by the Office;

(iii) For each cited pending unpublished U.S. application, the application specification including the claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion; and

(iv) All other information or that portion which caused it to be listed.

(3)(i) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56 (c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from applicant's specification or incorporated therein.

(ii) A copy of the translation if a written English-language translation of a non-English-language document, or portion thereof, is within the possession, custody, or control of, or is readily available to any individual designated in § 1.56(c).

(b)(1) Each U.S. patent listed in an information disclosure statement must be identified by inventor, patent number, and issue date.

(2) Each U.S. patent application publication listed in an information disclosure statement shall be identified by applicant, patent application publication number, and publication date.

(3) Each U.S. application listed in an information disclosure statement must be identified by the inventor, application number, and filing date.

(4) Each foreign patent or published foreign patent application listed in an information disclosure statement must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application.

(5) Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication.

(c) When the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of one of the patents or publications as specified in paragraph (a) of this section may be submitted without copies of the other patents or publications, provided that it is stated that these other patents or publications are cumulative.

(d) A copy of any patent, publication, pending U.S. application or other information, as specified in paragraph (a) of this section, listed in an information disclosure statement is required to be provided, even if the patent, publication, pending U.S. application or other information was previously submitted to, or cited by, the Office in an earlier application, unless:

(1) The earlier application is properly identified in the information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. 120; and

(2) The information disclosure statement submitted in the earlier application complies with paragraphs (a) through (c) of this section.

[42 FR 5594, Jan. 28, 1977; para. (a) 48 FR 2712, Jan. 20, 1983, effective date Feb. 27, 1983; 57 FR 2021, Jan. 17, 1992, effective Mar. 16, 1992; revised, 65 FR 54604, Sept. 8, 2000, effective Nov. 7, 2000; paras. (a)(2) and (b) revised, 65 FR 57024, Sept. 20, 2000, effective Nov. 29, 2000; para. (e) added, 68 FR 38611, June 30, 2003, effective July 30, 2003; paras. (a) and (c) revised and para. (e) removed, 69 FR 56481, Sept. 21, 2004, effective Oct. 21, 2004]

§ 1.99 Third-party submission in published application.

(a) A submission by a member of the public of patents or publications relevant to a pending published application may be entered in the application file if the submission complies with the requirements of this section and the application is still pending when the submission and application file are brought before the examiner.

(b) A submission under this section must identify the application to which it is directed by application number and include:

(1) The fee set forth in § 1.17(p);

(2) A list of the patents or publications submitted for consideration by the Office, including the date of publication of each patent or publication;

(3) A copy of each listed patent or publication in written form or at least the pertinent portions; and

(4) An English language translation of all the necessary and pertinent parts of any non-English language patent or publication in written form relied upon.

(c) The submission under this section must be served upon the applicant in accordance with § 1.248.

(d) A submission under this section shall not include any explanation of the patents or publications, or any other information. The Office will not enter such explanation or information if included in a submission under this section. A submission under this section is also limited to ten total patents or publications.

(e) A submission under this section must be filed within two months from the date of publication of the application (§ 1.215(a)) or prior to the mailing of a notice of allowance (§ 1.311), whichever is earlier. Any submission under this section not filed within this period is permitted only when the patents or publications could not have been submitted to the Office earlier, and must also be accompanied by the processing fee set forth in § 1.17(i). A submission by a member of the public to a pending published application that does not comply with the requirements of this section will not be entered.

(f) A member of the public may include a self-addressed postcard with a submission to receive an acknowledgment by the Office that the submission has been received. A member of the public filing a submission under this section will not receive any communications from the Office relating to the submission other than the return of a self-addressed postcard. In the absence of a request by the Office, an applicant has no duty to, and need not, reply to a submission under this section.

[48 FR 2712, Jan. 20, 1983; effective Feb. 27, 1983; removed and reserved, 57 FR 2021, Jan. 17, 1992, effective Mar. 16, 1992; added, 65 FR 57024, Sept. 20, 2000, effective Nov. 29, 2000; para. (f) corrected, 65 FR 66502, Nov. 6, 2000, effective Nov. 29, 2000; paras. (d) and (e) revised, 68 FR 38611, June 30, 2003, effective July 30, 2003]